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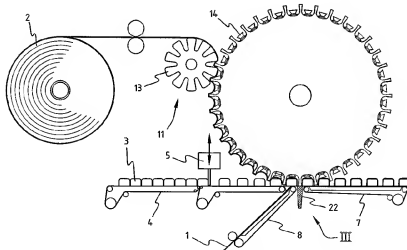
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(54) Title: **METHOD AND DEVICE FOR PACKAGING PRODUCTS AND ARRAY OF PACKAGED PRODUCTS**



(57) Abstract: A method for packaging products (3), such as candies, wherein the products are positioned on a first sheet (1) which is continuously moved in a transport direction, wherein the products are covered by a second sheet (2) which is continuously moved in the same transport direction and which is aligned substantially plane-parallel to the first sheet, and wherein the first and second sheets are sealed together near the outer edges of the individual products or grouped products by a sealing device (22), wherein the sealing device comprises scaling ribs (12) extending substantially transversely to the transport direction on one side of the moving sheets, wherein said scaling ribs (12) are being moved at the same speed as the sheets and the scaling ribs seal the first and second sheets together in the moving products.

**METHOD AND DEVICE FOR PACKAGING PRODUCTS AND ARRAY OF
PACKAGED PRODUCTS**

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The invention relates to a method for packaging products, such as candies, in a removable enclosure, wherein the products are positioned on a first sheet which is continuously moved in a transport direction, wherein the products are covered by a second sheet which is continuously moved in the same transport direction and which is aligned substantially plane-parallel to the first sheet, and wherein the first and second sheets are sealed together near the outer edges of the individual products or grouped products by a sealing device.

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Such a method is used for providing a bandoleer of individually packaged products or of products that are grouped together in one sealed envelope, wherein the envelopes can be separated from each other at a later stage. The invention aims at an improved method, wherein products can be wrapped efficiently at a fast speed, wherein the packaging device can be easily adapted for differently sized products, wherein as little packaging material as possible is used, and/or wherein brittle products can be wrapped with as little damage possible.

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To that end the sealing device comprises sealing ribs extending substantially transversely to the transport direction on one side of the moving sheets, wherein said sealing ribs are being moved at the same speed as the sheets and the sealing ribs seal the first and second sheets together in between the moving products. Thereby the sheets can move continuously, without the need to interrupt the

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movement for sealing the sheets together. Preferably the sealing device comprises a rotating frame, the rotation axis of said frame extending transversely to the transport direction, wherein said sealing ribs extend from a coaxial
5 cylindrical surface of said frame.

In order to prevent damage to the products, in particular if the products have a substantial height, at least one of said sheets is preferably pre-shaped to fit at least partially
10 around the products before the film comes into contact with the products. Said pre-shaping action is preferably performed by a pre-shaping device comprising a first rotating shaping frame on one side of the moving sheet and a second rotating shaping shape on the opposite side of the moving sheet, the
15 rotation axes of both frames extending transversely to the transport direction of the sheet, wherein said frames comprise co-operating protruding shaping ribs extending substantially transversely to the transport direction, wherein the shaping ribs of both frames move between each
20 other, and wherein said shaping ribs are being moved at the same speed as the pre-shaped sheet. Preferably the first pre-shaping frame is positioned such that it guides the pre-shaped film towards the other moving sheet while including the products. Preferably the first pre-shaping frame is the
25 same frame as the rotating frame of the sealing device, and the shaping ribs on said frame are said sealing ribs.

The described method is particularly advantageous when the products have an elongated form and are positioned
30 transversely on the first moving sheet. Preferably the sealing ribs comprise ultrasonic welding means. Preferably the sealed areas between the products are perforated or

scored, such that the packaged products stay attached to each other, but can be easily separated.

The invention also relates to a device for packaging
5 products, such as candies, comprising first transport means for continuously moving a first sheet in a transport direction, positioning means for positioning the products on the first sheet, second transport means for continuously moving a second sheet in the same transport direction in
10 alignment substantially plane-parallel to the first sheet while covering the products, and a sealing device for sealing the first and second sheets together near the outer edges of the individual products, wherein the sealing device comprises protruding sealing ribs extending substantially transversely
15 to the transport direction, and said sealing device further comprises synchronizing means for moving said sealing ribs at the same speed as the sheets while sealing the first and second sheets together in between the moving products.

20 Furthermore the invention relates to a method for packaging products, such as candies, wherein the products are positioned on a first sheet which is continuously moved in a transport direction, wherein the products are covered by a second sheet which is continuously moved in the same
25 transport direction and which is aligned substantially plane-parallel to the first sheet, and wherein the first and second sheets are sealed together near the outer edges of the individual products by a sealing device, wherein at least one of said sheets is pre-shaped by a pre-shaping device to fit
30 at least partially around the products before the sheet comes into contact with the products, wherein said pre-shaping device comprises a first rotating shaping frame on one side of the moving sheet and a second rotating shaping frame on

the opposite side of the moving sheet, the rotation axes of both drums extending transversely to the transport direction of the sheet, wherein said frames comprise co-operating protruding shaping ribs extending substantially transversely to the transport direction, wherein the shaping ribs of both frames move between each other, and wherein said shaping ribs are being moved at the same speed as the pre-shaped sheet.

The invention also relates to a device for packaging products, such as candies, comprising first transport means for continuously moving a first sheet in a transport direction, positioning means for positioning the products on the first sheet, second transport means for continuously moving a second sheet in the same transport direction in alignment substantially plane-parallel to the first sheet while covering the products, a sealing device for sealing the first and second sheets together near the outer edges of the individual products, and a pre-shaping device for pre-shaping at least one of said sheets to fit at least partially around the products before the sheet comes into contact with the products, wherein said pre-shaping device comprises co-operating protruding shaping ribs extending substantially transversely to the transport direction, wherein the shaping ribs of both drums are movable between each other, and said pre-shaping device further comprises synchronizing means for moving said shaping ribs at the same speed as the pre-shaped sheet.

Further the invention relates to an array of packaged products, such as candies, comprising two sheets which are sealed together and enclose said products or groups of products, wherein the sealed areas between the products are weakened, for instance by scores or perforations, such that

the packaged products can be easily separated, wherein one of said sheets is a substantially flat relatively rigid board or film and the other sheet is a relatively flexible foil shaped to fit at least partially around the products. Preferably the sides of the sealed sheets extending from the outer ends of the products are bend, upwards or downwards, in order to give the array rigidity in its longitudinal direction. In this manner a very efficiently packaged product is obtained. The extending sides of the sealed sheets can be given such a length that they can be bend further, over the packaged products and be sealed together, such that the rigid board forms a protective tubular box.

The invention will be illustrated with reference to the drawings, wherein:

Fig. 1 shows a schematic perspective view of a packaging device;

Fig. 2 shows a schematic side view of a detail of the packaging device of Fig. 1;

Fig. 3 shows a further schematic side view of a detail of the packaging device of Fig. 1;

Fig. 4 shows a perspective view of an array of packaged products.

With reference to Figures 1, 2 and 3 the packaging device has a first roll of card board 1 having a plastic coating on at least one side and a second roll of plastic film 2. The elongated candy bars 3 are placed transversely on a first endless conveyor 4. A separation device 5 has a barrier which

moves up and down at regular intervals for spacing the candy bars 3 a pre-defined distance apart.

The second conveyor 6, the third conveyor 7, the fourth
5 conveyor 8, the fifth conveyor 9, as well as the card board 1 all move at the same speed, which is larger than the speed of conveyor 4 in order to accommodate the larger mutual distance of the candy bars.

10 The plastic film 2 is led between a co-operating rotating shaping drums 10, 11. Both drums 10, 11 have protruding shaping ribs 12, 13 which during rotation are moved between each other like a gear unit, thereby corrugating the plastic film 2 into the desired shape. The drum 10 has flexible
15 suction cups 14 between its ribs 12 which hold the pre-shaped film by a vacuum action force.

The pre-shaped film 2 is placed on top of the moving candy bars 3 by the drum 10 while they are at the same time being
20 transferred by the conveyor 6 onto the coated side of moving cardboard 1. In this manner the candy bars 3 are enclosed in the cardboard 1 and the pre-shaped plastic film 2. When the ribs 12 are at their lowest point 2 they push the plastic film 2 onto the cardboard 1, where the plastic film 2 is
25 welded on the coated side of cardboard 1 by a first ultrasonic welding device 22, which co-operate with ultrasonic welding means present in the sealing ribs 12. In this manner a series of interconnected tubes is formed, each tube comprising a candy bar. By changing the opening time of
30 the separation device 5 also two or more candy bars 3 can be grouped together and enclosed in a single tube thereby.

Subsequently the transverse seals between the candy bars 3 are perforated or scored by a rotating drum 24 having scoring or perforating ribs 15. Then the ends of the film 1 which extend from the sides of the candy bars 3 are pushed down by two further ultrasonic sealing devices 16 and sealed to the cardboard 1, whereby the candy bars 3 are enclosed inside the cardboard and plastic film in an airtight manner. At this stage the candy bars 3 form an endless array of interconnected packaged products. The separation drum 17 separates the products into arrays 19 of for instance six candy bars each by means of cutting ribs 18.

The array 19 of candy bars 3 as shown in Figure 4 thereby has a cardboard layer 1 on the bottom side and a shaped plastic film layer 2 on the top side which is sealed onto the cardboard layer 1 in between the candy bars 3. These transverse seals have scores or perforations 20 so that individual products can be easily torn off, without breaking the seal. Both sealed longitudinal sides 21 of the package are folded upwards, giving the array 19 such rigidity that it can subsequently be treated as a box. The array 19 can be shipped to and exposed in shops, and sold to the public, without the need to enclose it in a further layer of plastic, as is the case with prior art packaging methods of candy bars.

CLAIMS

1. A method for packaging products (3), such as candies,
in a removable enclosure, wherein the products (3)
5 are positioned on a first sheet (1) which is
continuously moved in a transport direction, wherein
the products (3) are covered by a second sheet (2)
which is continuously moved in the same transport
direction and which is aligned substantially plane-
10 parallel to the first sheet (1), and wherein the
first and second sheets (1,2) are sealed together
near the outer edges of the individual products (3)
or grouped products by a sealing device (10, 22, 16),
characterised in that the sealing device comprises
15 sealing ribs (12) extending substantially
transversely to the transport direction on one side
of the moving sheets (1, 2), wherein said sealing
ribs (12) are being moved at the same speed as the
sheets (1, 2) and the sealing ribs (12) seal the
20 first and second sheets (1, 2) together in between
the moving products (3).
2. The method according to claim 1, wherein the sealing
device (10, 22, 16) comprises a rotating frame (10),
25 the rotation axis of said frame (10) extending
transversely to the transport direction, wherein said
sealing ribs (12) extend from a coaxial cylindrical
surface of said frame (10).
- 30 3. A method according to claim 1, wherein at least one
of said sheets (2) is pre-shaped to fit at least
partially around the products (3) before the sheet
(2) comes into contact with the products (3).

4. A method according to claim 2, wherein said pre-shaping action is performed by a pre-shaping device (10, 11) comprising a first rotating shaping frame (10) on one side of the moving sheet (2) and a second rotating shaping frame (11) on the opposite side of the moving sheet (2), the rotation axes of both frames (10, 11) extending transversely to the transport direction of the sheet (2), wherein said frames (10, 11) comprise co-operating protruding shaping ribs (12, 13) extending substantially transversely to the transport direction, wherein the shaping ribs (12, 13) of both frames (10, 11) move between each other, and wherein said shaping ribs (12, 13) are being moved at the same speed as the pre-shaped sheet (2).
5. A method according to claim 3, wherein the first pre-shaping frame (10) is positioned such that it guides the pre-shaped film (2) towards the other moving sheet (1) while including the products (3).
6. A method according to any of the preceding claims 1 - 4, wherein the products (3) have an elongated form and are positioned transversely on the first moving sheet (1).
7. A method according to any of the preceding claims 1 - 5, wherein the sealing ribs (12) comprise ultrasonic welding means.
8. A method according to any of the preceding claims, wherein the sealed areas between the products (3) are

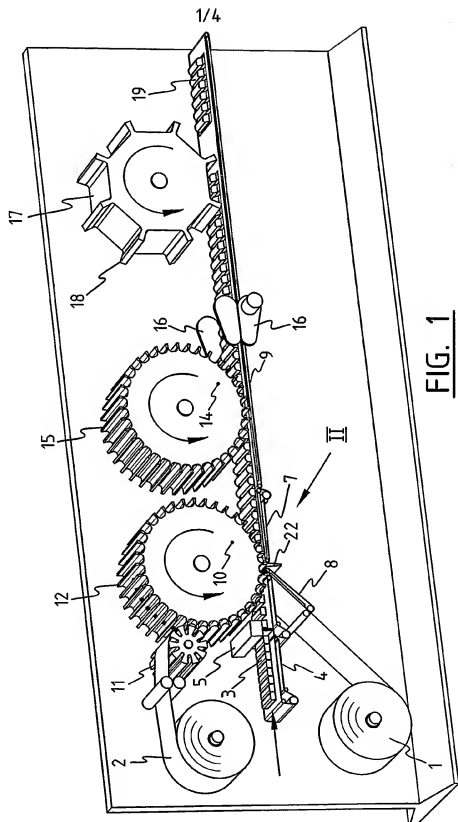
perforated or scored, such that the packaged products (3) stay attached to each other, but can be easily separated.

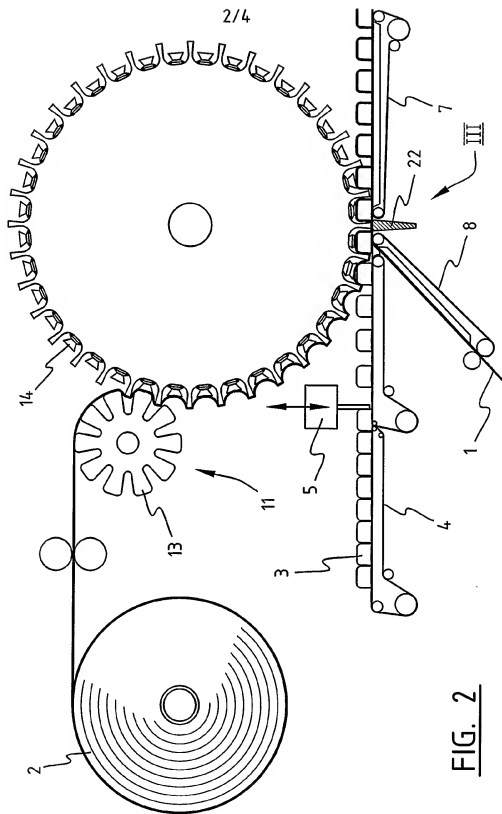
- 5 9. A device for packaging products (3), such as candies, comprising first transport means (8) for continuously moving a first sheet (1) in a transport direction, positioning means (4, 5, 6) for positioning the products (3) on the first sheet (1), second transport
10 means (10) for continuously moving a second sheet (2) in the same transport direction in alignment substantially plane-parallel to the first sheet (1) while covering the products (3), and a sealing device (10, 22, 16) for sealing the first and second sheets
15 (1, 2) together near the outer edges of the individual or grouped products (3), characterised in that the sealing device (10, 22, 16) comprises protruding sealing ribs (12) extending substantially transversely to the transport direction, and said
20 sealing device (10, 22, 16) further comprises synchronizing means for moving said sealing ribs (12) at the same speed as the sheets (1, 2) while sealing the first and second sheets (1, 2) together in between the moving products (3).
- 25 10. A method for packaging products (3), such as candies, wherein the products (3) are positioned on a first sheet (1) which is continuously moved in a transport direction, wherein the products (3) are covered by a
30 second sheet (2) which is continuously moved in the same transport direction and which is aligned substantially plane-parallel to the first sheet (1), and wherein the first and second sheets (1, 2) are

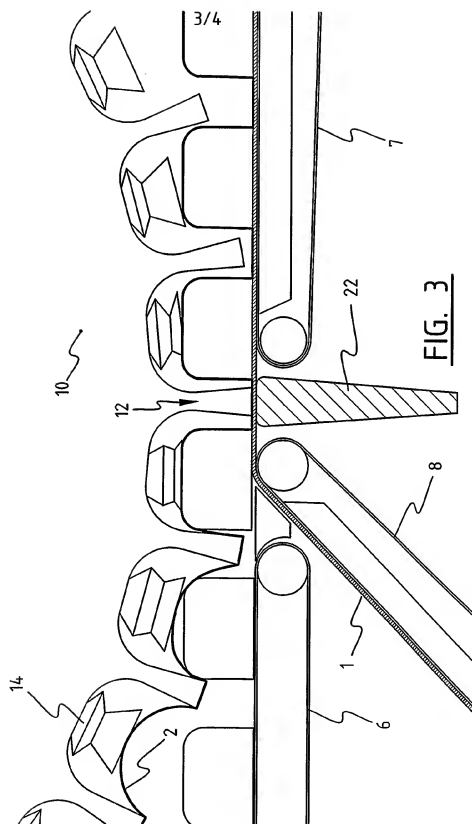
- sealed together near the outer edges of the individual grouped products (3) by a sealing device (10, 22, 16), wherein at least one of said sheets (2) is pre-shaped by a pre-shaping device (10, 11) to fit at least partially around the products (30) before the sheet (2) comes into contact with the products (3), characterised in that said pre-shaping device (10, 11) comprises a first rotating shaping frame (10) on one side of the moving sheet (2) and a second rotating shaping frame (11) on the opposite side of the moving sheet (2), the rotation axes of both frames extending transversely to the transport direction of the sheet (2), wherein said frames comprise co-operating protruding shaping ribs (12, 13) extending substantially transversely to the transport direction, wherein the shaping ribs (12, 13) of both frames (10, 11) move between each other, and wherein said shaping ribs (12, 13) are being moved at the same speed as the pre-shaped sheet (2).
11. A device for packaging products (3), such as candies, comprising first transport means (8) for continuously moving a first sheet (1) in a transport direction, positioning means (4, 5, 6) for positioning the products (3) on the first sheet (1), second transport means (10) for continuously moving a second sheet (2) in the same transport direction in alignment substantially plane-parallel to the first sheet (1) while covering the products (3), a sealing device (10, 22, 16) for sealing the first and second sheets (1, 2) together near the outer edges of the individual or grouped products (3), and a pre-shaping device (10, 11) for pre-shaping at least one of said

- 5 sheets (2) to fit at least partially around the products (3) before the sheet comes into contact with the products (3), characterised in that said pre-shaping device (10, 11) comprises a first rotating shaping frame (10) on one side of the moving sheet (2) and a second rotating shaping frame (11) on the opposite side of the moving sheet (2), the rotation axes of both frames (10, 11) extending transversely to the transport direction of the sheet (2), wherein said frames (10, 11) comprise co-operating protruding shaping ribs (12, 13) extending substantially transversely to the transport direction, wherein the shaping ribs (12, 13) of both frames are movable between each other, and said pre-shaping device (10, 11) further comprises synchronizing means for moving said shaping ribs (12, 13) at the same speed as the pre-shaped sheet (2).
- 10 12. An array (19) of packaged products (3), such as candies, comprising two sheets (1, 2) which are sealed together and enclose said products (3) or groups of products, wherein the sealed areas between the products (3) are weakened, such that the packaged products (3) can be easily separated, characterised in that one of said sheets (1) is a substantially flat relatively rigid board or film and the other sheet (2) is a relatively flexible foil shaped to fit at least partially around the products (3).
- 15 20 25 30 13. An array (19) of products (3) according to claim 11 or 12, wherein the products (3) have an elongated form and are positioned transversely with respect to the sheets (1, 2).

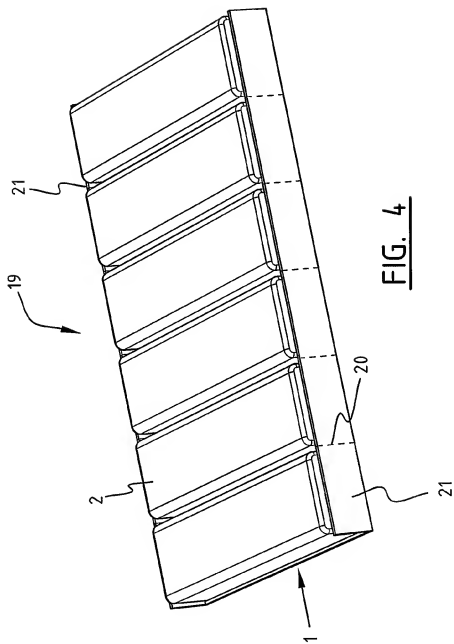
14. An array (19) of products according to claim 13,
 wherein the sides of the sealed sheets (1, 2)
 extending from the outer ends of the products (3) are
5 bend in order to give the array (19) rigidity in its
 longitudinal direction.







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INTERNATIONAL SEARCH REPORT

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 A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	abstract; figure 1	6, 8
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	abstract; figure 2	
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Y	page 6, line 22 - line 52; figures X-XI	8, 13
A	US 4 034 536 A (MAHAFFY REID A ET AL) 12 July 1977 (1977-07-12)	12
	abstract; figures 2, 5	
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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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